MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2015/2016

BDM2384 – DATABASE MANAGEMENT SYSTEMS

(All sections / Groups)

13 OCTOBER 2015
2.30pm – 4.30pm
(2 Hours)

INSTRUCTIONS TO STUDENTS

a) This Question paper consists of 3 pages (including cover page).

b) Answer all questions. All questions carry equal marks.

c) Please write all your answers in the Answer booklet provided.

Question 1 (25 Marks)

a) Database Design can be modelled using a similar SDLC type approach, referred to as the Database Development Life Cycle (DBLC). Outline the major steps that you would take in setting up a database for a particular enterprise. (10 Marks)

b) The relational database handles entities, attributes of entities and relationships between entities. Explain the difference between a simple attribute and a composite attribute? (2.5 Marks)

c) What is a derived attribute, and how is it different from a stored attribute? (2.5 Marks)

d) What is an associative entity? What conditions should exist in order to convert a relationship to an associative entity? (10 Marks)

Question 2 (25 Marks)

Automata Inc. produces specialty vehicles by contract. The company operates several departments, each of which builds a particular vehicle, such as a limousine, a truck, a van, or an RV. When a new vehicle is built, the department places an order with the purchasing department to request specific components. Automata's purchasing department is interested in creating a database to keep track of orders and to accelerate the process of delivering materials. The order received by the purchasing department may contain several different items. An inventory is maintained so that the most frequently requested items are delivered almost immediately. When an order comes in, it is checked to determine whether the requested item is in inventory. If an item is not in inventory, it must be ordered from a supplier. Each item may have several suppliers.

Given that functional description of the processes encountered at Automata's purchasing department, do the following:

a) Identify all of the main entities. (10 Marks)

b) Identify all of the relations and connectivities among entities. (5 Marks)

c) Identify the type of existence dependency in all relations. (5 Marks)

d) Give at least two examples of the types of reports that can be obtained from the database. (5 Marks)

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Question 3 (25 Marks)

Write the following queries in SQL, using the following university schema.
course(course_id, title, dept_name, credits)
instructor(ID, name, dep_name, salary)
section(course_id, sec_id, semester, year, building, room_number, time_slot_id)
student(ID, name, dept_name, tot_cred)
takes(ID, course_id, sec_id, semester, year, grade)

a) Find the titles of courses in the Comp. Sci. department that have 3 credits. (3 Marks)
b) Find the IDs of all students who were taught by an instructor named Einstein; make sure there are no duplicates in the result. (3 Marks)
c) Find the highest salary of any instructor. (3 Marks)
d) Find all instructors earning the highest salary (there may be more than one with the same salary). (4 Marks)
e) Find the enrollment of each section that was offered in autumn 2009. (4 Marks)
f) Find the maximum enrollment, across all sections, in autumn 2009. (4 Marks)
g) Find the sections that had the maximum enrollment in autumn 2009. (4 Marks)

Question 4 (25 Marks)

a) The simultaneous execution of transactions over a shared database can create several data integrity and consistency problems. Explain the three main problems. (10 Marks)

b) A *real-time data warehouse* is a *data warehouse* that is updated (by the ETL) the moment the transaction happens in the source system. What types of applications would benefit from real-time data warehousing? (10 Marks)

c) Briefly explain the components of a Distributed Database Management Systems (DDBMS). (5 Marks)

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